SH 153
.V7
COPY 2
[redacted]
[redacted]
[redacted]

133

153
y 2

A METHOD OF MEASURING FISH EGGS

By H. von Bayer, C. E.

Architect and Engineer, United States Bureau of Fisheries

Paper presented before the Fourth International Fishery Congress held at Washington, U. S. A., September 22 to 26, 1908

BULLETIN OF THE BUREAU OF FISHERIES : : : : : VOL. XXVIII, P. 1009-1014
Document No. 703 : Issued April, 1910

Copy 2

10-35-426

SH153
.V1
Copy2

APR 15 1910
D. OF D.

A METHOD OF MEASURING FISH EGGS.

By H. VON BAYER, C. E.,

Architect and Engineer, United States Bureau of Fisheries.

In a well-regulated fish hatchery it becomes at times necessary to count the eggs of fishes, so as to know the quantity on hand and prepare for certain shipments of eggs as well as for the future care of the fry. The methods thus

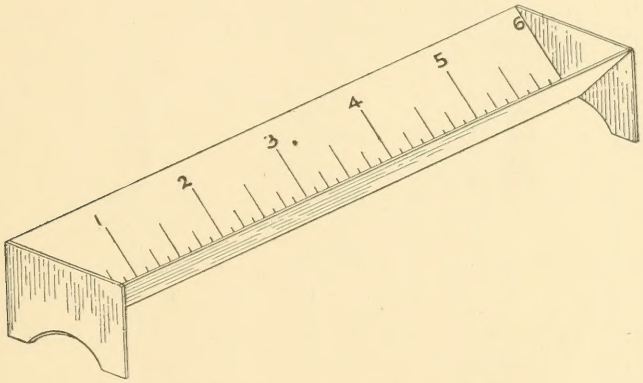


FIG. 1.—Metal trough for use in determining diameter of fish eggs.

far employed have been to determine by actual count the number of eggs contained in one liquid quart measure, and then to multiply said number by the number of quarts of eggs on hand; or to weigh one liquid quart of counted eggs, next to weigh all the eggs on hand, and then by simple proportion to determine the number of all the eggs.

The new method proposed by the writer is first to determine the diameter [a] of one egg, and then to enter with the value of said diameter a table or diagram

[a] By diameter is here understood the diameter of the egg including its surrounding matrix, if any.

in which the corresponding number of eggs per liquid quart or other unit measure is found by inspection.

To determine the diameter of one egg of a certain species of fish, a V-shaped metal trough with scale engraved thereon is used, in which a certain number of eggs is placed one egg deep in a row, the eggs touching each other; the space occupied by the eggs is then read on the scale; this reading, when divided by the number of eggs in the trough, will give the diameter of one egg.

The accompanying table and diagram are self-explaining. They are based on a series of actual counts of eggs contained in a liquid quart measure, these counts fairly agreeing with each other and the theoretical value, and being extended by computation according to the law that solids increase as the third power of their diameters.

Example:

$d = 0.127''$, diameter of whitefish egg (determined).

$n = 33{,}036$, number of whitefish eggs per quart (actually counted).

$d_1 = 0.1406''$, diameter of shad egg (determined).

n_1 = Number of shad eggs per quart (sought).

$$d^3 : d_1^3 = n_1 : n$$

$$\therefore n_1 = \frac{d^3 n}{d_1^3}, \text{ or}$$

$$0.127^3 : 0.1406^3 = n_1 : 33{,}036$$

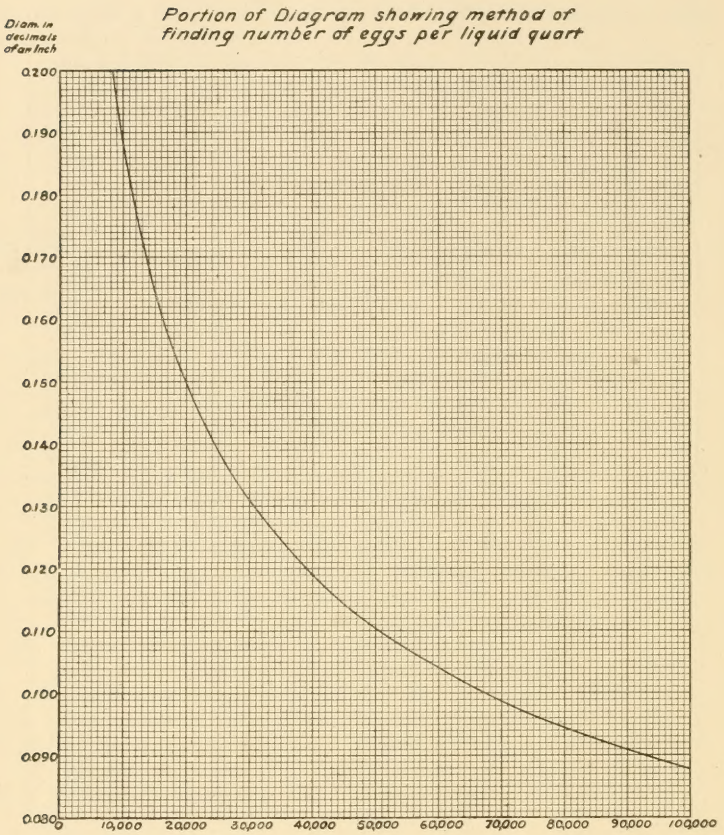
$$n_1 = \frac{0.127^3 \times 33{,}036}{0.1406^3} = 24{,}345, \text{ answer.}$$

TABLE FOR FINDING NUMBER OF FISH EGGS OF GIVEN DIAMETER PER LIQUID QUART.

Diameter.	Number.	Diameter.	Number.	Diameter.	Number.	Diameter.	Number.
Inch.		*Inch.*		*Inch.*		*Inch.*	
0.300	2,506	0.230	5,562	0.160	16,521	0.090	92,826
	2,531		5,635		16,835		95,990
	2,557		5,709		17,157		99,297
	2,583		5,785		17,487		102,762
	2,609		5,862		17,825		106,390
0.295	2,636	0.225	5,941	0.155	18,172	0.085	110,190
	2,663		6,021		18,528		114,172
	2,690		6,102		18,894		118,346
	2,718		6,185		19,270		122,730
	2,746		6,269	0.151	19,655		127,333
0.290	2,775	0.220	6,355	0.150	20,050	0.080	132,170
	2,804		6,442		20,456		137,251
	2,833		6,531		20,874		142,600
	2,863		6,622		21,303		148,220
	2,893		6,715		21,744		154,155
0.285	2,923	0.215	6,809	0.145	22,197	0.075	160,400
	2,954		6,905		22,662		166,995
	2,985		7,002		23,140		173,950
	3,017		7,102		23,633		181,300
	3,050		7,204		24,140		189,070
0.280	3,083	0.210	7,307	0.140	24,661	0.070	197,290
	3,116		7,412		25,197		205,992
	3,150		7,520		25,748		215,204
	3,184		7,629		26,316		224,995
	3,219		7,741		26,901		235,377
0.275	3,254	0.205	7,855	0.135	27,504	0.065	246,410
	3,290		7,971		28,125		258,141
	3,326		8,089		28,764		270,631
	3,363		8,210		29,422		283,936
	3,400	0.201	8,333		30,101		298,132
0.270	3,438	0.200	8,459	0.130	30,801	0.060	313,289
	3,476		8,587		31,523		329,490
	3,515		8,717		32,268		346,828
	3,555		8,851		33,036		365,405
	3,595		8,987		33,829		385,331
0.265	3,636	0.195	9,126	0.125	34,647	0.055	406,733
	3,677		9,268		35,492		429,750
	3,719		9,413		36,364		454,539
	3,762		9,561		37,265		481,270
	3,806		9,712		38,198		510,139
0.260	3,850	0.190	9,866	0.120	39,161	0.050	541,362
	3,895		10,023		40,156		575,173
	3,940		10,184		41,186		611,893
	3,986		10,348		42,251		651,776
	4,033		10,516		43,354		695,223
0.255	4,081	0.185	10,688	0.115	44,494	0.045	742,613
	4,129		10,863		45,676		794,400
	4,178		11,042		46,899		851,128
	4,228		11,225		48,166		913,380
0.251	4,279		11,412		49,480		981,852
0.250	4,331	0.180	11,603	0.110	50,841	0.040	1,057,350
	4,383		11,799		52,254		1,140,780
	4,436		11,999		53,720		1,233,250
	4,490		12,203		55,239		1,335,960
	4,545		12,412		56,817		1,450,406
0.245	4,601	0.175	12,627	0.105	58,456	0.035	1,578,320
	4,658		12,846		60,159		1,721,630
	4,716		13,069		61,925		1,883,020
	4,776		13,298		63,766		2,065,130
	4,835		13,533	0.101	65,680		2,271,500
0.240	4,895	0.170	13,774	0.100	67,670	0.030	2,506,310
	4,956		14,020		69,741		
	5,019		14,272		71,899		
	5,083		14,529		74,146		
	5,148		14,793		76,486		
0.235	5,214	0.165	15,064	0.095	78,927		
	5,281		15,341		81,473		
	5,350		15,625		84,130		
	5,419		15,916		86,904		
	5,490		16,215		89,800		

CONVERSION TABLE.

1 inch	=25.4 millimeters.	1 liter	= 1.0567 quarts.
1 millimeter	= 0.03937 inch.	1 pound	= 0.4536 kilogram.
1 quart	=57.75 cubic inches.	1 kilogram	= 2.2046 pounds.
1 quart	= 0.9464 liter.	Fahrenheit	=9/5 centigrade+32°.
1 liter	=61.0234 cubic inches.	Centigrade	=5/9 Fahrenheit−32°.



Directions: Find the line on the left margin corresponding to the given diameter; follow said line to the right until it intersects the curve; from this intersection proceed at right angles to the lower marginal line of figures and there read the required number of eggs per quart.

If diameter is given in millimeters multiply by 0.03937 to reduce to inches.

LIBRARY OF CONGRESS
0 002 854 007 3

Hollinger Co
pH 8.5

LIBRARY OF
0 002 854 007 3

Hollinger Corp.
pH 8.5